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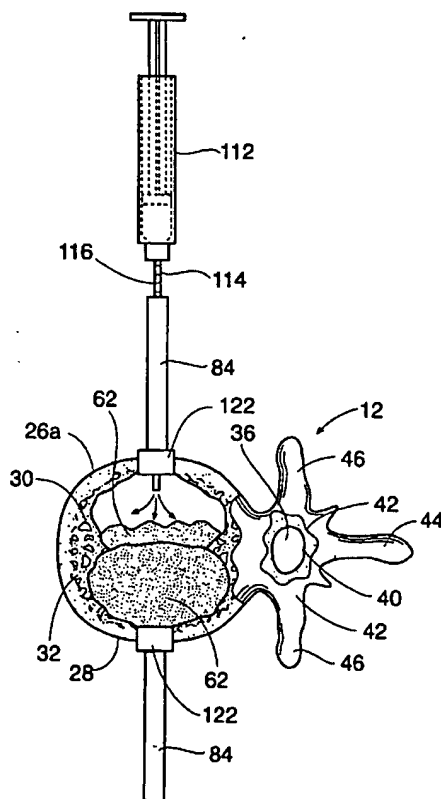
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[Continued on next page]

(54) Title: **SYSTEMS AND METHODS FOR TREATING VERTEBRAL BODIES**



(57) Abstract: Systems and methods treat at least two vertebral bodies in a spinal column. The systems and methods make use of first and second tool assemblies operable to treat an interior region of, respectively, a first vertebral body and a second vertebral body in the spinal column. The systems and methods provide directions for operating the first and second tool assemblies to treat the first and second vertebral bodies, at least for a portion of time.

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INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61F2/46

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61F A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 969 888 A (REILEY MARK A ET AL) 13 November 1990 (1990-11-13) cited in the application figures 8-28 column 6, line 9 -column 7, line 64	20,21
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A	claims 1,3,5,9,13; figures 1-6,8 --- -/--	1,7-9

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 99 62416 A (KYPHON INC) 9 December 1999 (1999-12-09) claims 45-47,53; figures 3,4,8,9,11,12,14 ---	1-7,13, 15,17, 18, 27-29, 44,45
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X	WO 99 51149 A (KYPHON INC) 14 October 1999 (1999-10-14) claim 1; figures 1-17,23 page 26, line 30 -page 27, line 6 ---	40,41, 44,45
A	---	20-22, 24,40, 41,44,45
A	US 5 385 566 A (ULLMARK GOESTA) 31 January 1995 (1995-01-31) figures 5,6 column 4, line 14 - line 52 ---	40,44
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/19700

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 1- 12 in part
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-19

A system for treating two vertebral bodies comprising a first tool assembly including a component that operates to form a cavity in the cancellous bone of a first vertebral body and a component that operates to convey material into the cavity,
a second tool assembly including a component that operates to convey material to penetrate cancellous bone of a second vertebral body without formation of a cavity.

(Problem: To increase the stability of two vertebral bones)

2. Claims: 20-26

A system for treating bone comprising an instrument introducer defining an access into cancellous through cortical bone, and an instrument sized for advancement through the access including a proximal stop having a dimension greater than the access passage.

(Problem: To prevent penetration of the instrument beyond a selected depth in the bone)

3. Claims: 27-39

A system for treating bone comprising a device adapted to be inserted into bone and thereafter expanded to form a cavity in cancellous bone,
a passage to convey fluid into the cavity as the device is returned to the collapsed condition and withdrawn from bone.

(Problem: To avoid collapsing of the created bone cavity during the process of collapsing and withdrawing the device from bone)

4. Claims: 40-45

An assembly for treating bone comprising a support body, a cortical bone cutting element carried on the support body and an expandable structure also carried on the support body.

(Problem: Cutting and compacting cancellous bone with only one instrument)

FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

Continuation of Box I.2

Claims Nos.: 1- 12 in part

Present claim 1 relates to an extremely large number of possible apparatus. Support within the meaning of Article 6 PCT is to be found, however, for only a very small proportion of the apparatus claimed. In the present case, the claim so lacks support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely:

A system to increase the mechanical stability of at least two vertebral bodies in a spinal column comprising,

a first tool assembly operable to treat an interior region of a first vertebral body
including a component that operates to form a cavity in cancellous bone and a component to convey material into the cavity or
including a component that operates to convey material to penetrate cancellous bone without formation of a cavity,

a second tool assembly operable to treat an interior region of a second vertebral body
including a component that operates to form a cavity in cancellous bone and a component to convey material into the cavity or
including a component that operates to convey material to penetrate cancellous bone without formation of a cavity, and

directions for operating the first and second tool assemblies to treat the first and second vertebral bodies, at least for a portion of time, concurrently.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No
PCT/US 01/19700

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